

What is claimed is:

1. A method of fabricating an earplug, said method comprising:
extruding a monolithic body of foamed elastomeric thermoplastic material about 5 to 20 millimeters in transverse dimension;
at least partially cutting the body into discrete pieces about 10-35 millimeters in length to form individual earplugs; and
disposing markings on a surface of the earplug.
2. The method of claim 1, wherein said markings are selected from the group consisting of decorative artwork, promotional markings, brand names, logos, indicia, trademarks, advertising, and combinations thereof.
3. The method of claim 1, wherein said disposing comprises a process selected from the group consisting of ink jet printing, bubble jet printing, laser printing, screen printing, offset printing, stamping, dye jet extrusion, and combinations thereof.
4. The method of claim 1, wherein said disposing includes offset printing.
5. The method of claim 1, wherein said markings are disposed on a skin which forms an outer surface of the monolithic body.
6. The method of claim 1, wherein said cutting is performed after said disposing.
7. The method of claim 1, wherein said disposing is performed after said cutting.
8. The method of claim 1, wherein said extruding comprises extruding a monolithic body of foamed elastomeric thermoplastic material about 10 to 20 millimeters in transverse dimension.
9. The method of claim 1, wherein said cutting comprises cutting the body proximate the die face as it emerges therefrom, prior to substantial expansion and cooling thereof, wherein a protective skin is formed at the ends of the pieces.

10. The method of claim 1, wherein said cutting further comprises forming convex end surfaces by cutting the extrudate as it emerges therefrom, prior to substantially complete cooling and expansion, wherein a convex, skinned surface is formed at the ends of the pieces as the extrudate expands and cools.
11. The method of claim 1, wherein the monolithic body has a density within a range of about 2 to 20 pcf (32 to 320kg/m³).
12. The method of claim 10, wherein the monolithic body has a density of about 6 to 12 pcf (96 to 192kg/m³).
13. The method of claim 1, wherein said monolithic body has a rate of recovery from compression to about 20 percent of its initial volume, and from compression under a 5 pound weight for 6 seconds, sufficient to recover about 90 percent or less of its initial volume in 45 seconds.
14. The method of claim 1, wherein said step of using an extruder further comprises extruding an extrudable material having a rate of recovery from being compressed under a 5 pound weight for 6 seconds, sufficient to recover about 90 percent or more of its initial volume in 90 seconds.
15. The method of claim 1, wherein the elastomeric thermoplastic material comprises:
- 95-105 parts by weight PVC resin;
 - 60 to 140 parts by weight plasticizer;
 - 5 to 30 parts by weight acrylic processing aid;
 - 0.1 to 20 parts by weight nucleator;
 - 0.5 to 10 parts by weight stabilizer;
 - 0 to 5 parts by weight external lubricant; and.
 - 0 to 1 part by weight dry flow promoter.
16. The method of claim 14, wherein the thermoplastic elastomeric material comprises:

100 parts by weight PVC resin;
80 parts by weight plasticizer;
7 parts by weight epoxidized soybean oil;
11 parts by weight acrylic processing aid;
6 parts by weight nucleator;
2.5 parts by weight stabilizer; and
0.5 parts by weight external lubricant.

17. The method of claim 1, wherein said method is a substantially continuous process.
18. A monolithic earplug formed by the method of claim 1.
19. An earplug sized and shaped for being received in the human ear canal, said earplug comprising:
 - an extruded monolithic body of foamed elastomeric thermoplastic material about 5 to 20 millimeters in transverse dimension having a length of about 10-35 millimeters; and
 - markings disposed on at least one surface of said earplug.
20. The earplug of claim 19, wherein said markings are selected from the group consisting of decorative artwork, promotional markings, brand names, logos, indicia, trademarks, advertising, and combinations thereof.
21. The earplug of claim 19, wherein said markings are disposed on an end portion thereof.
22. The earplug of claim 19, wherein said markings are disposed on a longitudinal surface of said monolithic body.
23. The earplug of claim 19, wherein said markings consists of non-toxic materials.

24. The earplug of claim 19, wherein said transverse dimension is in the range from about 10 to about 20 millimeters.

25. The earplug of claim 19, wherein said body has a substantially cylindrical outer surface along at least a majority of its length.

26. The earplug of claim 24, wherein said body has a substantially consistent transverse dimension throughout its length.

27. The earplug of claim 19, having a density in the range of between about 2 to about 20 pcf (32 to 320kg/m³).

28. The earplug of claim 19, having a density in the range of between about 6 to about 12 pcf (96 to 192kg/m³).

29. The earplug of claim 19, further comprising a continuous skin about the outer surface and end portions of said monolithic body.

30. The earplug of claim 28, wherein said markings are disposed on said continuous skin.

31. The earplug of claim 28, wherein said continuous skin is formed by cutting the body proximate the die face as the body emerges therefrom, prior to substantial expansion and cooling thereof, said continuous skin being formed as said thermoplastic material continues to expand and cool.

32. The earplug of claim 28, wherein said end portions are substantially convex.

33. The earplug of claim 19, having a rate of recovery from 80 percent compression sufficient to recover about 90 percent or less of its initial volume in about 45 seconds.

34. The earplug of claim 32, having a rate of recovery wherein after being compressed under a 5 pound weight for 6 seconds, the earplug recovers about 90 percent or more of its initial volume in about 90 seconds.

35. A monolithic earplug formed by the process of:
disposing a PVC-based material within an extruder under heat and pressure;
incorporating a blowing agent into the material;
extruding the material in a longitudinal direction from a die into an ambient environment wherein the blowing agent foams the extrudate, the extrudate having a transverse cross-sectional dimension of about 10 to 20 millimeters;
cutting the extrudate at a substantially 90 degree angle to the longitudinal direction as the extrudate emerges from the die and prior to substantially complete cooling and expansion thereof, wherein a convex, skinned surface is formed at the cut ends as the extrudate expands and cools to form a monolithic earplug having a density of about 6 to 12 pcf (96 to 192kg/m³), and a rate of recovery from 80 percent compression sufficient to recover about 90 percent or less of its initial volume in 45 seconds, and after being compressed under a 5 pound weight for 6 seconds, to recover about 90 percent or more of its initial volume in 90 seconds; and
disposing markings on at least one surface of the earplugs.